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भाग 9 प्रकाशित गुणधर्म
अनुभाग 10 रंजक के स्राव का
गुणात्मक मूल्यांकन

Plastics — Methods of Testing

Part 9 Optical Properties
Section 10 Qualitative evaluation
of the bleeding of colorants

ICS 83.080

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FOREWORD

This Indian Standard (Part 9/Sec 10) was adopted by Bureau of Indian Standards, after the draft finalized by the Methods of Sampling and Tests for Plastics Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

The bleeding specifically relates to the running of colour and is often with transfer of substances between materials in contact with each other. Migration displacement of a compound within the material or from one material to another by diffusion at molecular level.

In bleeding the material, compound rise to the surface and thus are able to leave their original environment in mass. In case of migration, the compounds are able to make their way through the material to the new site.

The term bleeding will be used for synergies of colours and migration for internal transfer. A donor environment which contains the migrating compound and a receptive environment for which migration compound presents the affinity. It needs a carrier which is a substance that carries the migrating compound. There are a number of factors facilitate or accelerate migration.

In the preparation of this standard, assistance has been derived from ISO 183 : 1976¹⁾ 'Plastics — Qualitative evaluation of the bleeding of colorants'.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

1) Withdrawn in 2002.

*Indian Standard***PLASTICS — METHODS OF TESTING****PART 9 OPTICAL PROPERTIES****Section 10 Qualitative evaluation
of the bleeding of colorants****1 SCOPE**

This standard (Part 9/ Sec 10) specifies a method for the qualitative evaluation of the tendency of some colouring materials to “bleed off” or to migrate from a plastic material into other materials, if they are in close contact with each other.

If the properties of different colorants have to be compared, they should be compounded with a given plastic in a suitable standardized formulation.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibilities of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 13360 (Part 2 /Sec 1) : 2016 /ISO 293 : 2004	Plastics — Methods of testing: Part 2 Sampling and preparation of test specimens, Section 1 Plastics — Compression moulding of test specimens of thermoplastic materials (<i>first revision</i>)
IS 13360 (Part 2 /Sec 2) : 2013 /ISO 295 : 2004	Plastics — Methods of testing: Part 2 Sampling and preparation of test specimens, Section 2 Compression moulding of test specimens of thermosetting materials
IS 13360 (Part 2 /Sec 3) : 2000 /ISO 294-1 : 1996	Plastics — Methods of testing: Part 2 Sampling and preparation of test specimens, Section 3 Injection moulding of test specimens of thermoplastic materials — General principles and moulding of multipurpose and bar test specimens

*IS No.**Title*

IS 13360 (Part 2 /Sec 7) : 2016 /ISO 294-3 : 2002	Plastics — Methods of testing: Part 2 Sampling and preparation of test specimens, Section 7 Injection moulding of test specimens of thermoplastic materials — Small plates (<i>second revision</i>)
IS 13360 (Part 2 /Sec 9) : 2000 /ISO 294-2 : 1996	Plastics — Methods of testing: Part 2 Sampling and preparation of test specimens, Section 9 Injection moulding of test specimens of thermoplastic materials — Small tensile bars

3 DEFINITION

For the purpose of this standard, the following definition shall apply.

3.1 Colour Bleeding

The migration of a dye present in a plastic material from the material itself into any other material, when they are in close contact. This “bleeding” may be due to:

- Exudation of the colouring matter because of the low compatibility of the colouring matter with the plastic material, or
- The solubility of the colouring matter in a plasticizer with migrating tendencies.

The colour bleeding depends also on the nature of the other material (acceptor) which therefore needs to be exactly defined. In general, this effect is accelerated by increase in temperature.

4 PRINCIPLE

Maintenance of a test specimen in contact under pressure with specified acceptors at an elevated temperature, the nature of the acceptor and the test temperature being stated in the material specification or being agreed between the interested parties for the plastic material in question. For PVC based materials 50°C is specified.

5 APPARATUS

5.1 Air oven capable of maintaining a temperature of 50°C or other agreed temperature, with a tolerance of $\pm 2^\circ\text{C}$.

5.2 Plate glass pieces with perfectly flat surfaces, 75 mm square and 5 mm thick.

5.3 Acceptor materials, such as:

5.3.1 White Filter Paper

Smooth, 75 mm square. In case of disagreement, the quality of the paper shall be agreed between purchaser and vendor.

5.3.2 Plasticized Polyvinyl Chloride Sheet

Clear, colourless, in pieces 75 mm square, 1 mm thick formulated as follows:

- a) Polyvinyl chloride (suspension polymer), 100 parts by mass;
- b) Di-2-ethylhexyl phthalate, 65 parts by mass; and
- c) Calcium stearate, 1 part by mass.

The sheet shall be moulded [*see* IS 13360 (Part 2 /Sec 1)] or calendered at a suitable temperature, in order to obtain a completely fused, clear, colourless material.

6 TEST SPECIMENS

6.1 The test specimen shall be in the form of a 50 mm square, cut directly from a sheet of the material to be tested. The thickness is of no importance.

6.2 If the material to be tested is an extrusion or moulding compound in granules or in chips, a sheet shall be prepared from it by a suitable moulding method, and the specimen shall be cut from the sheet thus obtained.

NOTE — Attention is drawn to the provisions of IS 13360 (Part 2/Sec 1), IS 13360 (Part 2/Sec 2), IS 13360 (Part 2 /Sec 3), IS 13360 (Part 2/Sec 7), IS 13360 (Part 2/Sec 9).

6.3 The method of preparing the test specimen shall be well defined for each type of plastic material, in as much as the thermal treatment and the subsequent

transformation of the material (for example the “gelatinization” or “fusion” of polyvinyl chloride) may have some influence on the colour bleeding.

7 PROCEDURE

7.1 Place the test specimen on a piece of PVC sheet (**5.3.2**); cover it with a 75 mm square of dry white filter paper (**5.3.1**); place the assembly thus obtained between two pieces of the plate glass (**5.2**).

NOTE — The test specimens and the absorbent sheets must be brought into close contact; this is assured by the weight of the upper glass plate; it is not, therefore, permissible to place several specimens between larger plates.

7.2 Place the assembly in the air oven (**5.1**) maintained at the agreed temperature with a tolerance of $\pm 2^\circ\text{C}$ (*see* 4).

7.3 After 72 ± 1 h, remove the assembly from the oven, separate its parts and examine the square piece of PVC sheet (**5.3.2**) and the filter paper (**5.3.1**) for staining or marking.

7.4 Examine the PVC sheet (**5.3.2**) first over a white and then over a black background.

8 TEST REPORT

The report shall include the following information:

- a) Reference to this standard;
- b) Complete identification of the material tested, including the formulation of the compound and the method of preparing the specimens;
- c) Complete identification of the acceptor material;
- d) The test temperature;
- e) Indication of the presence of staining or marking on the filter paper and on the PVC sheet, with an approximate description, such as : none — moderate — excessive;
- f) Observations on any change in appearance of the surfaces, both of the specimen and of the absorbing materials, which were in contact during the test; and
- g) Date of test.

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